Claims:

1. A method for correcting humidity measurement results of a radiosonde in respect to errors resulting from radiative heat exchange, the radiosonde comprising at least a humidity sensor, **characterised** in that the method comprises

forming (10) beforehand a data structure (20), which comprises correction values of humidity measurement results in different environmental conditions, environmental conditions being determined in said data structure as a function of at least one environmental conditions parameter, or determining beforehand a mathematical function, by means of which one is able to calculate a correction value for humidity measurement result corresponding at least one current environmental conditions parameter, said environmental conditions parameter being a variable having an effect in the environment of the humidity sensor and said correction values being determined so that they correct errors resulting from radiative heat exchange,

measuring (12) environmental humidity $U_m$ with said humidity sensor,

determining current value of at least one environmental conditions parameter, and

calculating (14) error-corrected humidity U directly or indirectly by means of said measured environmental humidity $U_m$ and a correction value corresponding said at least one current environmental conditions parameter value in said data structure or a correction value calculated with said mathematical function.

2. A method according to claim 1, **characterised** in that said environmental conditions parameter relates to at least one variable affecting the humidity measurement result, such as pressure, environmental temperature, humidity, location altitude of the radiosonde, sounding time of the radiosonde, intensity of solar radiation, solar elevation angle, location of the radiosonde on the globe or ascending speed of the radiosonde.

3. A method according to any one of preceding claims, **characterised** in that said correction value of humidity measurement results is based on at least one variable affecting the humidity measurement result, such as pressure, environmental temperature, humidity, location altitude of the radiosonde, sounding time of the radiosonde, intensity of solar radiation, solar elevation angle, location of the radiosonde on the globe or the ascending speed of the radiosonde.

4. A method according to any one of preceding claims, **characterised** in that said correction values are differences $\Delta T_U$ between environmental temperature and humidity sensor temperature.

5. A method according to any one of preceding claims, **characterised** in the said data structure (20) is formed based on comparison measurements.

6. A method according to any one of preceding claims, **characterised** in that said correction values are correction values of saturation humidity level $\Delta U_{rh}$, and that the method comprises

   calculating error-corrected U by means of $\Delta U_{rh}$ corresponding said at least one current environmental conditions parameter value and of measured environmental humidity $U_m$.

7. A method according to any one of preceding claims, **characterised** in that said correction values are directly the correction values of saturation humidity level $\Delta U$, and that the method comprises

   calculating error-corrected U by means of $\Delta U$ corresponding said at least one current environmental conditions parameter value and of measured environmental humidity $U_m$.

8. A method according to any one of preceding claims, **characterised** in that in

said data structure (20) environmental conditions are determined as a function of air pressure P and solar elevation angle h.

9. A method according to any one of preceding claims, **characterised** in that in said data structure (20) environmental conditions are determined as a function of saturation humidity rh dependent on temperature and of air pressure P.

10. A method according to any one of preceding claims, **characterised** in that said correction values are differences $\Delta T_U$ between environmental temperature and humidity sensor temperature, that said radiosonde comprises additionally a temperature sensor, and that the method comprises

measuring (11) environmental temperature $T_T$ with said temperature sensor,

calculating (13), by means of $\Delta T_U$ corresponding said at least one current environmental conditions parameter value and of said environmental temperature $T_T$, the humidity sensor temperature $T_U$, and

calculating (14) error-corrected humidity U by means of calculated humidity sensor temperature $T_U$, environmental temperature $T_T$ and measured environmental humidity $U_m$.

11. A method according to claim 10, **characterised** in that the method comprises

error-correcting measured environmental temperature $T_T$ before calculating humidity sensor temperature $T_U$, and

using error-corrected environmental temperature $T_T$ in calculating humidity sensor temperature $T_U$ and error-corrected humidity U.

12. A method according to claim 10 or 11, **characterised** in that the humidity sensor temperature $T_U$ is calculated in the following way:

$T_U = T_T + k_U \cdot \Delta T_U$, in which

$T_T$ = environmental temperature measured with temperature sensor advantageously error-corrected,

$k_U$ = ventilation factor in relation to a nominal value, and

$\Delta T_U$ = difference between environmental temperature and humidity sensor temperature in current environmental conditions.

13. A method according to any one of claims 10-12, **characterised** in that the error-corrected humidity U is determined in the following way:

$$U = \frac{e(T_T)}{e_w(T_T)} \cdot 100 = \frac{e_w(T_U)}{e_w(T_T)} \cdot U_m \text{, in which}$$

$T_T$ = environmental temperature measured with temperature sensor advantageously error-corrected,

$T_U$ = humidity sensor temperature,

$U_m$ = measured humidity,

$e_w(T_U)$ = partial pressure of saturated water vapour in temperature $T_U$,

$e_w(T_T)$ = partial pressure of saturated water vapour in temperature $T_T$, and

$e(T_T)$ = actual vapour pressure in temperature $T_T$.

14. A data processing device (30) for correcting humidity measurement results of a radiosonde in respect to errors resulting from radiative heat exchange, the radiosonde comprising at least a humidity sensor, **characterised** by the data processing device comprising

a beforehand formed data structure (35) which comprises correction values of humidity measurement results in different environmental conditions, the environmental conditions being determined in said data structure as a function of said at least one environmental conditions parameter, or a memory (33) comprising a beforehand determined mathematical function by means of which one may calculate a correction value of humidity measurement result corresponding at least one current environmental conditions parameter value, said environmental conditions parameter being a variable having an effect in the environment of the humidity sensor and said correction values being determined so that they correct errors resulting from radiative heat exchange,

receiving means (32) for receiving humidity $U_m$ measured with said

humidity sensor and receiving the current value of at least one environmental conditions parameter, and

calculation means (31, 34) for calculating error-corrected humidity U directly or indirectly by means of said measured environmental humidity $U_m$ and a correction value corresponding said at least one current environmental conditions parameter value in said data structure or a correction value calculated with said mathematical function.

15. A data processing device according to claim 14, **characterised** in that said data processing device is located in said radiosonde.

16. A computer program which provides a routine for correcting humidity measurement results of a radiosonde in respect to errors resulting from radiative heat exchange, when running said computer program, the radiosonde comprising at least a humidity sensor, and said computer program communicating with

a beforehand formed data structure which comprises correction values of humidity measurement results in different environmental conditions, the environmental conditions being determined in said data structure as a function of at least one environmental conditions parameter, or a memory which comprises a beforehand determined mathematical function by means of which one may calculate a correction value corresponding at least one current environmental conditions parameter value, said environmental conditions parameter being a variable having an effect in the environment of the humidity sensor and said correction values being determined so that they correct errors resulting from radiative heat exchange, said computer program comprising

a program code for receiving humidity $U_m$ measured with said humidity sensor and receiving the current value of at least one environmental conditions parameter, and

a program code for calculating error-corrected humidity U directly or indirectly by means of said measured environmental humidity $U_m$ and a

correction value corresponding said at least one current environmental conditions parameter value in said data structure or a correction value calculated with said mathematical function.

17. A computer program according to claim 16, stored in a storage medium.